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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

DISTRICT H

COAL FATAL

REPORT OF MULTIPLE FATAL BUMP ACCIDENT
SUNNYSIDE NO. 1 MINE
KAISER STEEL CORPORATION
SUNNYSIDE, CARBON COUNTY, UTAH

December 4, 1957

By

Thomas T. Reay, Jr.
Coal-Mine Inspector

and

Lester L. Naus
Mining Health and Safety Engineer

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INTRODUCTION

Dan Dragon, age 56; Ernest Andrezzi, age 48; and Raymond G. Medina, age 25, timbermen, were killed instantly at 10:07 a.m., Wednesday, December 4, 1927 in the Sunnyside No. 1 mine, Kaiser Steel Corporation, Sunnyside, Carbon County, Utah, when a sudden bump dislodged the rib rock on the right side of the manway for a distance of 220 feet outby 4th right No. 2 slope, filling the manway with rock to within about 3½ feet of the roof. The manway had been graded through former caves of the roof so that the floor of the manway was about the same level as the top of the coal bed.

Dan Dragon, who had about 22 years mining experience, the last 5 years at this mine, leaves no dependents. Ernest Andrezzi, who had 14 years of mining experience, the last 6 years at this mine, is survived by his widow and no dependent children. Raymond G. Medina, who had nearly 2 years mining experience, all at this mine, is survived only by his widow.

Thomas T. Reay, Jr., who was notified of the accident about 11:10 a.m., December 4th by a company official while on a routine inspection of the Castle Gate No. 2 mine at Castle Gate, Utah, returned to Price, Utah, 11 miles from Castle Gate, and notified the Salt Lake City office about 12:30 p.m. and then went immediately to the mine, 28 miles from Price, arriving there about 1:15 p.m. Owing to the working of the roof in the affected area the investigation was postponed until the following morning, Thursday, December 5. Mr. Lester L. Naus arrived in Price, Utah Thursday afternoon and investigated the accident on Friday, December 6.

GENERAL INFORMATION

The Sunnyside No. 1 mine, Kaiser Steel Corporation, is at Sunnyside, Carbon County, Utah, on a branch line of the Denver & Rio Grande Western Railroad, and on State Highway 123. The mine is opened by nine slopes, a

rock tunnel, and two air shafts. At the time of this accident 330 men were employed, of whom 245 worked underground on three shifts and 85 worked on the surface on two shifts, 5 days a week. The average daily production of 3,700 tons of coal was mined with continuous miners and loaded with mobile loading machines into electrically driven shuttle cars and hauled to the surface in all-steel mine cars, handled by an underground hoist and by trolley locomotives.

The mine is developed in the Lower Sunnyside coal bed, which ranges from 7 to 14 feet in thickness and dips from 4 to 12 degrees in a northeasterly direction. The mine was developed by the room-and-pillar and panel-and-entry systems. Main entries, raise entries (bleeder entries), and dip entries were driven in sets of two, three, or four, and the intervals between the room-and-pillar entries varied according to local conditions, ranging from 250 to 600 feet. Pillars were recovered by the pillar-pocket method of mining; generally, the entire thickness of the coal bed was mined on the retreat. Entries were driven from 16 to 18 feet in width and rooms 26 feet in width; crosscuts were driven about 16 feet in width.

The immediate roof overlying the coal bed where the accident occurred consisted of 3 feet of sandy shale, 1½ feet of coal, 4½ feet of laminated shale, 1 foot of shale pencil streaked with coal, 2 feet of shale, 1½ feet of coal and shale, and then 3 feet of sandy shale. The active workings of the Sunnyside No. 1 mine underlie an area of rugged topographical relief marked by abrupt changes in cover which ranges up to 2,300 feet in thickness and averages 1,200 feet in thickness over the area where the bump occurred. The cover consists of strong, massive sandstone members interspersed with thin beds of shales. It is generally conceded that the nature of the topography which characterizes the Sunnyside area is conducive to bumps in mines of the area.

The systematic method of roof support, which was well-followed, consisted of using roof bolts ranging from 48 to 120 inches in length with 2½- by 12-foot airplane steel landing mats, in addition to regular 8- by 8- by 3/8-inch bearing plates. Roof bolts were placed to within 18 inches of the faces, and in most instances conventional timbers were set so as to provide additional roof support. Safety jacks or posts with large cap pieces were placed before the roof-bolting was started. In some haulageways and intake and return airways, numerous cribs 5 and 7 feet square were built, and recently steel yieldable arches were set on the main slope and manways. The program of installing yieldable arches continues. The roof was tested at frequent intervals by the workmen, and the officials stated that they examined the roof along the roadways and travelways at least once each shift, using special testing rods during their examinations.

The mine is classed gassy in accordance with the laws of the State. The last previous inspection of this mine was completed on September 13, 1957

Sketches of the scene of the accident are appended. Information for this report was obtained from mine officials and employees and from a visit to the scene of the accident.

The investigating committee consisted of the following persons:

Kaiser Steel Corporation

John Peperakis	Manager of Operations
T. R. McCourt	Supt. Nos. 1 and 3 Mines
Frank Markosek	Supt. No. 2 Mine
William Cave	Mine Foreman No. 1 Mine
Clarence E. Self	Safety Engineer, Sunnyside Mines
Joe Taylor	Mine Engineer
Melvin O. Pierce	Timberman (witness)
Tony Medrick	Timberman (witness)
Donald Rich	Horse driver (witness)

United Mine Workers of America

Frank Stevenson	President Local 9958
Emmett McFadden	Safety Committeeman
Henry A. Brownfield	Safety Committeeman

Industrial Commission of Utah

James H. Phillips	Coal Mine Inspector

Bureau of Mines

Thomas T. Reay, Jr.	Coal-Mine Inspector
Lester L. Naus	Mining Health and Safety Engineer

DESCRIPTION OF ACCIDENT

The manway on the right side of No. 2 slope, driven many years ago, was about 12 feet wide and it had caved in an arch shape about 12½ feet above the coal bed, narrowing to about 3 feet in width at the top. The present company leveled the cave off to the top of the coal bed and bolted the ribs and roof with bolts 8 and 10 feet long, spaced close together, using 8-inch square by 3/8-inch thick steel bearing plates, and in some instances using wooden-block bearing plates, 18 inches long by 12 inches wide by 3 inches thick. All bolts in this area were installed in rock. The rib and roof bolting of this section of the manway was completed in 1954.

During the graveyard shift Wednesday morning 10 cars of railroad ties had been unloaded in a crosscut between the haulage slope and the manway at 4 right No. 2 slope. The day shift crew; namely, Tony Medrick,

Melvin Pierce, Donald Rich, Raymond Medina, Dan Dragon, and Ernest Andrezzi arrived there about 7:30 a.m. Pierce, Medina, Dragon and Andrezzi hauled some ties in a rubber-tired wheelbarrow and carried some through the airlock doors into the air course, where Medrick piled them along the air course and Rich hauled them up the air course in a sled drawn by a horse where cribs were to be built at 3 right. By 10:15 a.m. 200 ties had been taken away leaving only 6 ties to be hauled away. Five were loaded on the wheelbarrow and Pierce walked ahead,carrying a tie, to open the airlock doors. Dragon and Andrezzi were helping to pull the wheelbarrow and Medina was pushing it, when suddenly a bump occurred knocking down Pierce and Medrick. Medrick, who was inside the doors, crawled back through the doors and asked Pierce whether he was all right. Pierce said "yes" and that he thought the other three men, Medina, Dragon and Andrezzi were caught under the cave. Medrick and Pierce went into the air course and sent Rich to a nearby shop for help. Very little could be done for several minutes because of clouds of dust in the air. By the time the atmosphere had cleared, employees from nearby working sections had arrived and by 10:30 a.m. bodies of two of the victims had been recovered. The third body was recovered by 1:00 p.m. Donald Rich, the driver, said that he could not start the horse for about 30 minutes after the bump. It stood still as if "frozen" and sweated profusely. There was a slight heaving of the track in the slope but not serious enough to interfere with haulage. Also, very little damage was done in the return airway. The rock burst from the right rib of the manway above the top of the coal bed was 220 feet long, 12 feet wide, and about 8 feet high.

CAUSE OF ACCIDENT

This accident was caused by a severe bump which dislodged rib rock supported by well-anchored roof bolts. Bumps such as the one which caused the death of these three men is one of the unsolved problems of coal mining today. These bumps occur with such irregularity and unpredictability that no method, system, or device has been developed to enable an inspector or the management to determine when they will occur. Until some plan is developed to indicate the possible occurrence of bumps in a mine, we offer no recommendations or remedies to prevent future accidents caused by bumps in this mine.

BRIEF HISTORY OF BUMPS IN THE SUNNYSIDE NO. 1 MINE

The appended map shows areas of the Sunnyside No. 1 mine that have been seriously affected by bumps during 1957. Essentially the same areas affected by bumps of January 24 and 27, 1957 were involved in bumps in 1944 and 1952, respectively. The bump of 1944 caused caving of the roof along the No. 2 slope and the bump of 1952 was manifest to the portals of raise entries driven to the surface from the present motor road. It is understood that intermittent bumps had occurred in the goaf area on the

right or south side of the No. 2 slope while workmen were erecting cribs in the right (south) return airway since the bumps of January 1957.

The forces of the bump of December 4 appeared to emanate from practically the same center as the bump of January 24 except that it appeared to center in a pillar between the manway and return airway to the right (south) of the slope. Although the area affected by the bump of December 4 was less extensive than that of January 24, the shock was felt throughout the mine, at the mine office on the surface, and by workmen on the surface directly above the 13 left parting off the slope where the depth of the cover is about 750 feet. The fact that the main slope was not seriously damaged on December 4 can be attributed to the heavily reinforcement of the area with 12- by 12-inch three-piece timber sets and yieldable steel arch sets since the bump of January 24. The slope track was thrown out of alignment; however, there was little heaving of the floor. The reinforced concrete footing along the slope showed indications of movement by the widening of cracks resulting from the bump of January 24 and the presence of new cracks.

As far as could be determined when the affected area was visited on December 5 and 6, the force of the bump appeared to have been expended in the rock overlying the coal along the right (south) rib of the manway. The rib rock appeared to have been thrown out enmasse into the manway which was filled to within $3\frac{1}{2}$ feet of the roof. The rock broke near the center line of the roof in the oval shaped manway with the roof to the left (north) side showing no effects other than the splintering of the wooden head blocks bolted in place. Roof bolts in the displaced rib rock were badly bent and apparently were pulled from their anchorage marked in some instances by the wedges still in place in the roof.

Geophysical Aspects Relating To Bumps

The faulted structure of the Sunnyside area, which has been recognized by some as being responsible for the severe bumps in mines of the area, has been known for many years.

The seismograph at the University of Utah, Salt Lake City, Utah recorded a disturbance at the time of the bump on January 27, 1957 and again at the time of the bump on December 4. A strong earthquake not in the immediate vicinity of Salt Lake City was recorded on the seismograph between the hours of 5 and 7 a.m. on December 4. The epicenter of the earthquake was determined to be at least 5,000 miles from Salt Lake City.

In view of these recorded disturbances, it is only logical to assume that movement along the fault zone in the Sunnyside area may play a part in the prevalence of bumps of severe intensity in mines of the Sunnyside area. Be that as it may, until such time when more study is given to the problem, the assumption cannot be discounted. Furthermore,

until a more complete understanding of the problem is attained there is little that can be offered to prevent accidents from bumps such as this.

ACKNOWLEDGMENT

The cooperation of the company officials, employees, mine safety committee, and James H. Phillips, State coal-mine inspector, during this investigation is gratefully acknowledged.

Respectfully submitted,

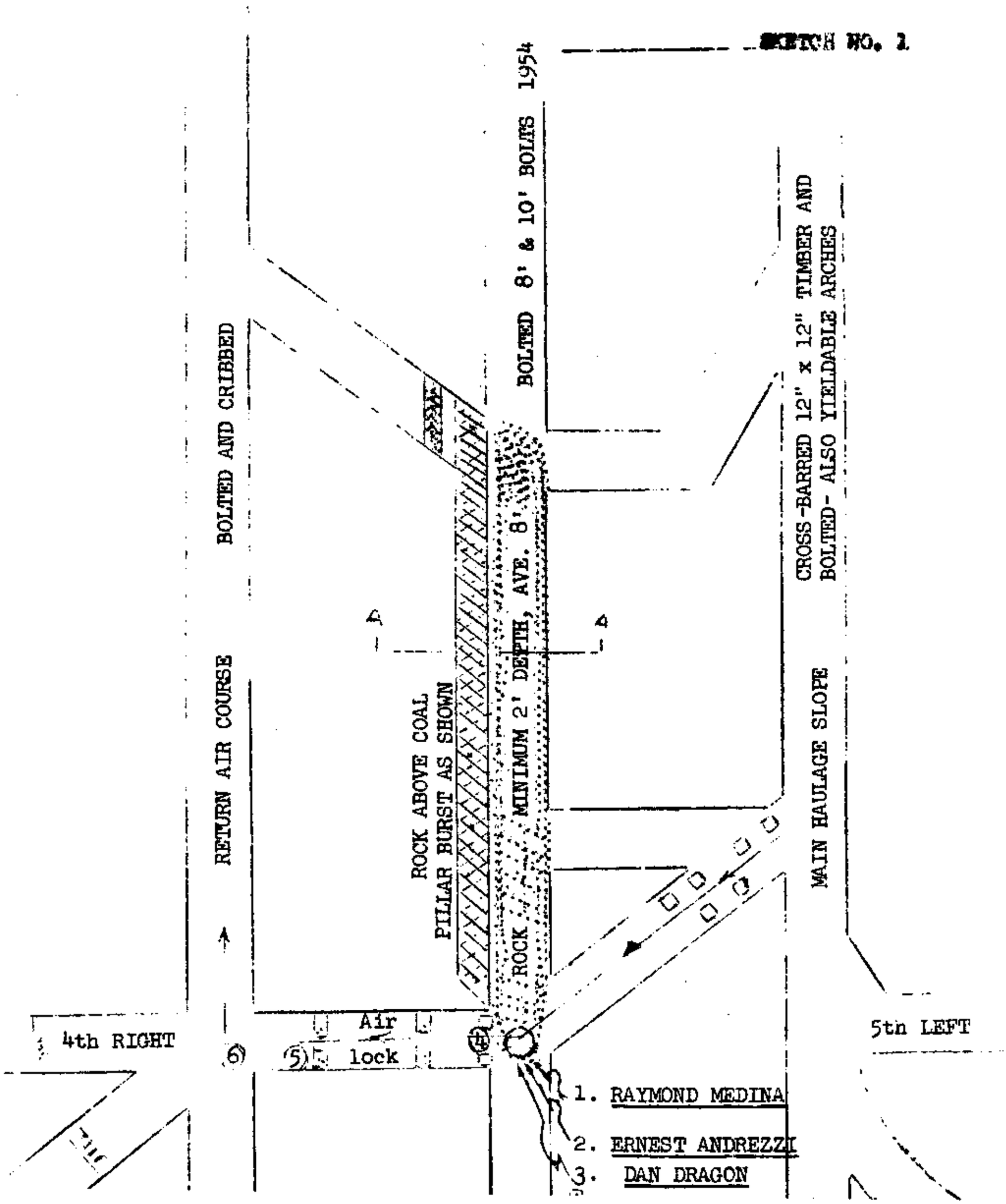
/s/ Thomas T. Reay, Jr.

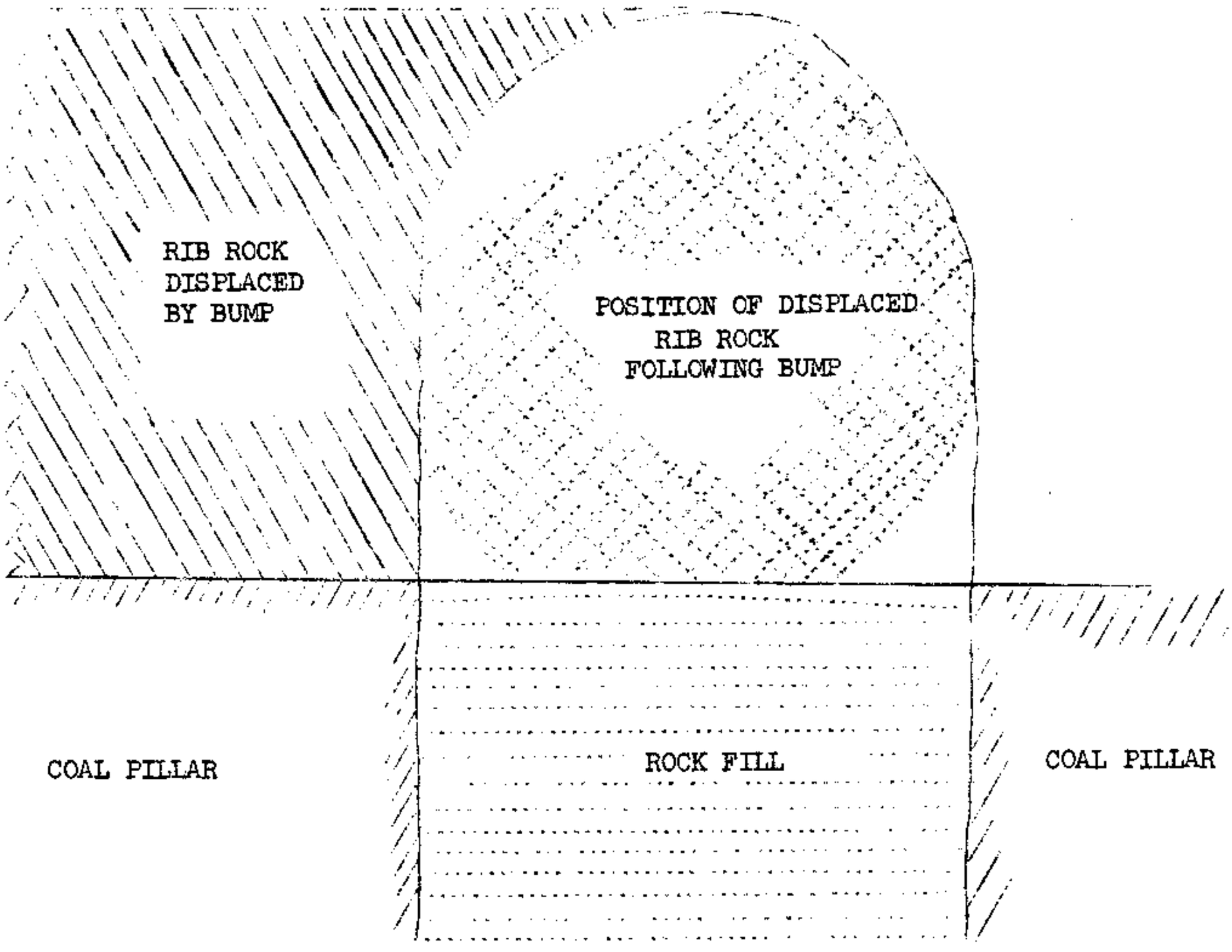
Thomas T. Reay, Jr.
Coal-Mine Inspector

/s/ Lester L. Naus

Lester L. Naus
Mining Health and Safety Engineer

SKETCH NO. 1


BOLTED AND CRIBBED
RETURN AIR COURSE
BOLTED 8' & 10' BOLTS 1954
ROCK ABOVE COAL
PILLAR BURST AS SHOWN
ROCK MINIMUM 2' DEPTH, AVE. 8'
CROSS-BARRED 12" x 12" TIMBER AND
BOLTED- ALSO YIELDABLE ARCHES
MAIN HAULAGE SLOPE
4th RIGHT
Air
lock
5th LEFT
1. RAYMOND MEDINA
2. ERNEST ANDREZZI
3. DAN DRAGON



SECTION THROUGH A - A OF SKETCH
OF MULTIPLE BUMP FATALITY
SUNNYSIDE NO. 1 MINE
WEDNESDAY, DECEMBER 4, 1957

SKETCH NO. 2

Scale 1" = 4'

FATAL ACCIDENT DATA

1. Name of victim: Dan Dragon

2. Mine Sunnyside No. 1 Company Kaiser Steel Corporation

   Location Sunnyside, Carbon County, Utah

3. Daily employment 330 Time of accident: 10:07 a.m.

4. General location of accident: Manway 4 right

5. Job when injured: Timberman Regular Job: Timberman

6. Age 56 Years experience regular job: 5 years In Mines: 22 years

7. Dependents: Widow No Number children under age 18: None Others --

8. Method of loading in place where accident occurred: Mechanical DNA
   Hand into cars or conveyors: DNA Other: Tramming timber

9. Location: Face Room Haulage Idle Workings Other: Manway

10. Type of permanent support in use at location where accident occurred:
    Posts Crossbars Bolts X None

11. Type of temporary support in use in place where accident occurred:
    Posts Crossbars Jacks None DNA

12. Did injury occur inby last permanent roof support : DNA

13. Distance from last supports to face: DNA

14. Was standard support plan adopted: Yes, Roof and Ribs bolted.
    Was it followed in this place: Yes

15. Last prior visit by mine official: Date 12-4-57 Time: 8:30 a.m.

16. Approximate dimensions of fall in feet: Length: 220 Width: 12
    Max. thickness: 8

DNA Does not apply.

FATAL ACCIDENT DATA

1. Name of victim Ernest Andrezzi

2. Mine Sunnyside No. 1 Company Kaiser Steel Corporation

3. Daily employment 330 Time of accident: 10:07 a.m.

4. General location of accident: Manway 4 right

5. Job when injured: Timberman Regular job: Mason

6. Age 48 Years experience regular job: 6 years In mines: 14 years

7. Dependents: Widow Yes Number of children under age 18: None Others --

8. Method of loading in place where accident occurred: Mechanical --
Hand into cars or conveyors: -- Other: Tramming timber

Note: Items 9 to 16 should be included if the fatality results from a fall of roof, face, or rib.

9. Location: Face___ Room___ Haulageway___ Idle Workings___ Other Manway

10. Type of permanent support in use at location where accident occurred:
Posts_____ Crossbars_____ Bolts X None:_____

11. Type of temporary support in use in place where accident occurred:
posts_____ Crossbars_____ Jacks_____ None DNA

12. Dis injury occur inby last permanent roof support: DNA

13. Distance from last supports to face: Permanent -- Temporary-- DNA

14. Was standard support plan adopted: Yes Roof and Ribs bolted
Was it followed in this place: Yes

15. Last prior visit by mine official: Date 12/4/57 Time: 8:30 a.m.

16. Approximate dimensions of fall in feet: Length: 220 Width: 12
Max. thickness: 8

DNA - Does not apply.

FATAL ACCIDENT DATA

1. Name of victim Raymond G. Medina

2. Mine Sunnyside No. 1 Mine Company Kaiser Steel Corporation
Location: Sunnyside, Carbon County, Utah

3. Daily employment: 330 Time of accident: 10:07 a.m.

4. General location of accident: Manway

5. Job when injured: Timberman Regular job: Mason

6. Age 25 Years experience regular job 1 year 10 months In mines 1 year/ 10 months

7. Dependents: Widow: Yes Number of children under age 18: None Others--

8. Method of loading in place where accident occurred: Mechanical DNA
Hand into cars or conveyors DNA Other Tramming timber

Note: Items 9 to 16 should be included if the fatality results from a fall of roof, face, or rib.

9. Location: Face Room Haulageway Idle Workings Other Manway

10. Type of permanent support in use at location where accident occurred:
Posts Crossbars Bolts X None

11. Type of temporary support in use in place where accident occurred:
Posts Crossbars Jacks None DNA

12. Did injury occur inby last permanent roof support: No

13. Distance from last supports to face: Permanent -- Temporary -- DNA

14. Was standard support plan adopted: Yes, Roof and ribs bolted
Was it followed in this place Yes

15. Last prior visit by mine official: Date 12/4/57 Time 8:30 a.m.

15. Approximate dimensions of fall in feet: Length: 220 Width: 12
Max. thickness: 8

DNA - Does not apply